

Appendix R

Department of Army Test Facilities

R-1. Overview of Army test facilities

a. This appendix provides synopses of DA test facilities for quick reference. More detailed information on the capabilities may be obtained from the test facility or its parent command.

b. The Army maintains and operates six of the DOD Major Range and Test Facility Base (MRTFB) facilities, which are regarded as “national assets,” that are maintained under uniform guidelines primarily for DOD T&E support missions and functions. The U. S. Army Space and Missile Defense Command (SMDC) operates two MRTFBs (the High Energy Laser Systems Test Facility and the Ronald Reagan Ballistic Missile Defense Test Site). The U.S. Army Test and Evaluation Command (ATEC) operates the remaining four MRTFB activities (US Army Aberdeen Test Center, U.S. Army Dugway Proving Ground, U.S. Army Yuma Proving Ground, and the U.S. Army White Sands Missile Range, which includes the Electronic Proving Ground) as well as two other test facilities (US Army Aviation Technical Test Center and the U.S. Army Redstone Technical Test Center). A synopsis of each follows.

R-2. Aberdeen Test Center

Aberdeen Test Center (ATC), located on Aberdeen Proving Ground, Maryland. It is a multipurpose test center with diverse capabilities and the Defense Department’s lead agency for developmental land combat and direct-fire testing.

a. ATC provides a single location where combat systems can be subjected to a full range of tests from automotive endurance and full weapons performance through induced environmental extremes to full-scale live fire vulnerability/survivability/lethality testing using an extensive array of test ranges and facilities, simulators, and models. Testing is conducted on both full systems and system components and includes armored vehicles, guns, ammunition, trucks, bridges, generators, night vision devices, individual equipment such as boots, uniforms, and helmets, and surface and underwater naval systems.

b. ATC offers numerous exterior and interior firing ranges, automotive courses, chambers simulating various environmental conditions, two underwater explosion ponds, sophisticated non-destructive test facilities, multifunctional laboratories, and an extensive industrial complex that includes maintenance and experimental fabrication capabilities. Ammunition is prepared in on-site ammunition plants to meet customer needs. Experienced personnel also conduct and/or support tests at other locations throughout the world with extensive mobile instrumentation.

c. ATC serves as the host for the Army Pulse Radiation Facility, the nation’s only combined ionizing nuclear radiation environmental simulation laboratory capable of supporting DT and OT from discrete electronic components up through complete systems at full threat specification levels.

R-3. Aviation Technical Test Center

Aviation Technical Test Center (ATTC), located at Cairns Army Airfield (CAAF), is a tenant of the U.S. Army Aviation Center at Fort Rucker, AL. With nearly 50 years of experience in the field of aviation developmental testing, it is a highly flexible test organization that provides a high degree of test mobility on the total integrated aviation system.

a. ATTC conducts developmental flight-testing and airworthiness qualification testing on subsonic fixed- and rotary-wing aircraft, aircraft systems and subsystems, and aviation support equipment. Flight-testing focuses on assessing system performance, system integration with the aircraft and other installed systems, system safety, soldier/machine interface, human factors engineering, and logistics supportability. Airworthiness qualification testing, which is performed by experimental test pilots, assesses the flight characteristics and handling qualities of the aerial vehicle and its in-flight performance. Because of the test mobility inherent to aviation, ATTC has the capability to conduct extensive testing at off-site locations throughout the continental US, where specific test capabilities or climatic conditions are required.

b. ATTC facilities include three hangars and 12 support shops located on CAAF and access to two hard-surface runways. The ATTC maintains a fleet of 16 test bed aircraft, representing the Army’s fielded aviation systems. The one-of-a-kind Helicopter Icing Spray System allows ATTC to evaluate airframe icing characteristics and de-icing/anti-icing system performance in artificial icing conditions.

R-4. Central Test Support Facility

The CTSF, located on Fort Hood, Texas, is operated and funded by the Program Executive Office C3T. It is identified as the intra-Army interoperability testing facility to perform the communications/data interfaces testing. The mission is to test all-Army C4I systems to ensure interoperability in accordance with Intra-Army Interoperability Certification Policy, Acquisition Executive Memorandum “Intra-Army Interoperability Certification,” Secretary of the Army, Information Systems (IAA) (SAIS-IAA), dated 3 December 2000. The CTSF testing process is modeled after the Army Test and Evaluation Command/US Army Operational Test Command guidelines.

a. CTSF testing in support of the intra-Army certification process will not duplicate or limit testing conducted by the Joint Interoperability Test Command (JITC), the U.S. Army Test and Evaluation Command, or other test activities. The

CTSF testing bays are instrumented with Electronic Proving Grounds (EPG) collection and reduction devices. Partnership enables the testers to integrate the instrumentation with the Army Battle Command System (ABCS) systems.

b. The CTSF conducts the required intra-Army interoperability certification testing and provides the test results to the Army's certification authority, HQDA CIO/G-6.

R-5. Dugway Proving Ground

Dugway Proving Ground (DPG) is located approximately 75 miles southwest of Salt Lake City, UT, in the Great Salt Lake Desert. This remote, isolated installation serves as the Defense Department's primary chemical and biological defense testing center.

a. DPG conducts exploratory and developmental tests of chemical and biological defense systems, smoke and obscurant munitions and delivery systems. Testing is also conducted on all materiel commodities to assess chemical/biological hardness and contamination/decontamination survivability.

b. DPG's facilities include indoor laboratories and test chambers, as well as outdoor test sites and extensively instrumented test grids for use with simulants. State-of-the-art chemical testing facilities support indoor testing of large-scale military vehicles and aircraft in hazardous environments as well as simulant-only testing. The Life Sciences Test Facility has the only chamber in the United States designed to test against potentially lethal agents in aerosol form. Other facilities allow testers to evaluate the environmental results from open burning and open detonation, accurately replicating real-world disposal operations. The DPG range also includes extensive mortar and artillery firing ranges for testing smoke and illumination rounds.

R-6. High Energy Laser Systems Test Facility

The High Energy Laser Systems Test Facility (HELSTF) is the DOD high-energy laser (HEL) test activity within the MRTFB. It is the only approved above-the-horizon dynamic HEL test range. The Laser Clearinghouse has accredited HELSTF for decentralized predictive avoidance for dynamic HEL testing. HELSTF has a complete set of HEL diagnostic instrumentation, including an outdoor explosive test range, an indoor coupon test area, and a large vacuum chamber (50 foot diameter, 650, 000 foot altitude capability). HELSTF has a complete carpentry and metal shop for fabrication of test support equipment and a complete Atmospheric Sciences department to collect atmospheric data during all tests and to provide pre-test prediction of atmospheric propagation based on M&S and databases maintained at HELSTF. The Mid-Infrared Advanced Chemical Laser (MIRACL), a megawatt class CW Deuterium Fluoride laser, is able to test in all these test areas through a complete set of beam steering optics. In addition, the SeaLite Beam Director (SLBD), is capable of placing the MIRACL beam on a variety of static to highly maneuverable tactical targets for research and development and proof-of-principle testing. The SLBD also serves as the most accurate and longest range imager for ballistic missile tests conducted at WSMR, NM.

R-7. U.S. Army Kwajalein Atoll/Ronald Reagan Ballistic Missile Defense Test Site

U.S. Army Kwajalein Atoll/Ronald Reagan Ballistic Missile Defense Test Site (USAKA/RTS) is located in the Republic of the Marshall Islands and encompasses approximately 750,000 square miles (although the total land area is only about 70 square miles). Its isolated location and specialized state-of-the-art data-gathering devices make USAKA/RTS uniquely qualified for ballistic missile testing and space-object tracking, with minimal safety and environmental constraints. USAKA/RTS provides range radar tracking, impact scoring, recovery, and telemetry data collection for intercontinental and theater ballistic missiles, orbital objects, and reentry vehicles. Facilities include a broad range of ground and mobile instrumentation, radar tracking and imaging, telemetry, and splash detection radar, and large aperture optical sensors. Intercontinental ballistic missiles can be launched from CA (4,840 miles), intermediate-range missiles from Hawaii (2,430 miles), shorter range theater missile defense-type missiles from Wake Island (730 miles), and other alternate launch sites (240-450 miles). The natural configuration of the atoll (more than 90 islands forming the world's largest lagoon) facilitates tracking and recovery of reentry vehicles and local launches with minimal safety and environmental constraints.

R-8. Redstone Technical Test Center

The Redstone Technical Test Center (RTTC) is located on Redstone Arsenal in northern Alabama, adjacent to the high technology community of Huntsville. It is the Army's tester of small rockets and missiles.

a. RTTC conducts performance, quality assurance and reliability testing of small rockets, missiles, rocket and missile components, and associated hardware. It is unique in its ability to test electrical, electro-optical, mechanical and explosive components for product assurance, and verify component, subsystem, and system performance before committing to flight testing. All types of natural and operationally induced dynamic, environmental, and electromagnetic testing can also be performed. RTTC is also the primary lightning effects tester for munitions and ordnance in DOD.

b. Located in the foothills of the Appalachian Mountains, RTTC's highly instrumented open-air ranges provide an uncluttered environment. Facilities include fully instrumented flight ranges, dynamic warhead test sled tracks, static rocket motor test stands and a full range of dynamic, climatic, electromagnetic and lightning facilities for testing missiles and weapon systems. Highly automated laboratory facilities are available for testing all types of weapons

components and subsystems under realistic climatic and dynamic conditions. RTTC operates the Army's largest rocket motor static test facility.

R-9. Virtual Proving Ground

The Virtual Proving Ground (VPG) is throughout the Army Developmental Test Command (DTC). The VPG is a composite of facilities and technologies that enhance DTC's test program with the aid of computer modeling and realistic simulations. The methods and technologies used by the VPG to test emerging military equipment and systems are undergoing a far-reaching transformation, one that parallels the transformation that is taking place within the Army and the other military services.

R-10. White Sands Missile Range

White Sands Missile Range (WSMR) operates two separate testing ranges. WSMR, the main testing range that includes the headquarters, is located in the Tularosa Basin in south central New Mexico, near the communities of El Paso, Las Cruces, and Fort Bliss, TX. The EPG is located on Fort Huachuca, in southeastern Arizona near the foothills of the Huachuca Mountains. EPG also has field offices at Fort Lewis, WA and Fort Hood, TX.

a. WSMR.

(1) WSMR is primarily a missile range for testing ballistic and guided missiles, and air defense systems, but it also supports a variety of testing needs. These include the full range of electromagnetic effects and nuclear environments testing; artillery and associated command and control systems; aircraft (fixed-wing) armament; and temperature, shock, and vibration effects. As the nation's largest overland range, WSMR provides the opportunity for post-test analysis on recovered debris.

(2) WSMR has more than 1,500 precisely surveyed instrumentation sites with high-speed cameras, tracking telescopes, interferometer systems, and radar and telemetry tracking/receiving stations to collect data during testing. Laboratory facilities include environment, weapon systems simulation, guidance and control, propulsion, climatic, metallography and microbiological. The Lightning Test Facility provides direct and near strike capability for systems under test. In addition to on-post missile and rocket launch sites, the range has developed facilities in New Mexico, Utah and Idaho for long-range firings that impact on WSMR.

b. EPG.

(1) EPG is the Army's principal center for developmental testing of command, control, communications, computer and intelligence (C4I) equipment and systems. It also conducts tests on electronic warfare, optical/electro-optical, unmanned/micro-aerial vehicles, global positioning systems, and aircraft navigation and avionics systems. Test capabilities include the full spectrum of electronics testing—from tests of subsystems such as antennas, transceivers or switches to the entire system. EPG has the capability to perform EMC and EMV analyses of tactical electronic equipment and systems to include generation of realistic friendly and enemy electromagnetic battlefield environments. Instrumented range services include video and telemetry tracking, position location via radar and position location systems, air surveillance and tracking, and meteorological monitoring.

(2) EPG maintains a full-service, highly instrumented test range and can track and collect data from all types of air and ground systems. Facilities include an electromagnetic environmental test facility, environmental chambers, a stress loading facility to measure the full load performance of communication systems, an EMI/EMC/TEMPEST test facility, and many unique, specialized facilities for testing of antennas, radar, unmanned aerial vehicles, and computer software. The surrounding mountain ranges create a natural and effective barrier to outside EMI and allow the unrestricted use of a wide range of frequencies.

R-11. Yuma Proving Ground

Yuma Proving Ground (YPG) is located in southwestern Arizona in the Sonoran Desert, approximately 24 miles northeast of the city of Yuma. YPG is assigned the Cold Regions Test Center (CRTC) and mission and the Tropic Regions Test Center (TRTC) mission, in addition to its desert environment test mission.

a. YPG.

(1) YPG is the lead test center for extreme natural environment testing. YPG also has the capability to perform as a general purpose proving ground and functions as a DOD MRTFB. YPG is located within a road, rail, and air network, offering rapid access to its testing and training areas. Additional access is offered through MCAS Yuma, approximately 25 miles south. YPG has priority of use on the seven Restricted Airspace Areas overlying its range area and the KOFA Game Range. It includes five major types of landscape, characterized as rugged mountains, moderately rugged mountains, rugged hills, alluvial fans, and alluvial aprons and plains. YPG is divided into two major range areas, with desert environment and desert automotive testing balanced between the two, as follows:

(a) The KOFA Firing Range Complex offers customers up to 75 km firing range coupled with 24-hours-per-day/7 days-per-week airspace control. KOFA Range is an integrated test complex for open air testing for direct fire weapons, artillery, mortars, mines and countermines, demolitions, and small missiles. KOFA Range has 21 fixed, permanent firing positions, over 310 surveyed firing points, and 13 improved and dedicated explosive and non-explosive impact fields, making siting tests, observing projectile impact, and recovery of components very efficient. Ammunition is

prepared in on-site ammunition plants to meet customer needs. Conditioning boxes and chambers provide rapid turn-around for increased firing rates.

(b) Cibola Range is a highly instrumented rotary-wing aircraft armament range in the United States. There are 11 drop zones for personnel, hazardous material (to include live ammunition) and multi-purpose airdrop testing supported by Laguna Army Airfield, Castle Dome Heliport, and MCAS Yuma. Laguna is capable of handling all current U.S. military transport and cargo aircraft. A highly instrumented helicopter armament test range, direct fire and moving target ranges, environmental chambers, a modern mine and demolitions test facility, and over 200 miles of improved road courses for testing tracked and wheeled military vehicles are also located on the North-South range. The Cibola Range's 18 by 40 mile range system provides near-sea-level density altitude conditions typical of many of the world's deserts.

(2) The YPG desert environment testing and desert automotive test facilities provide the ideal location for testing individual and soldier support equipment and automotive systems and components under harsh, desert conditions. There are eight special desert terrain test courses, prepared test slopes and obstacles, and a 2½-mile paved dynamometer course available for automotive testing. These are backed by vehicle fording basins, swim testing facilities, fuel and lubricant testing, and instrumentation capabilities available for wheeled and tracked vehicles. The Mid-East test course is a grueling 22-mile desert terrain course that simulates conditions found in the world's deserts.

b. *Cold Regions Test Center (CRTC)*. CRTC is located at Fort Wainwright, AK. CRTC offers a full range of test capabilities and professional expertise for temperate, Basic Cold (-5 °F to -25 °F) and Cold (-25 °F to -50 °F) natural environment testing for Army systems. These include combat and tactical vehicles, infantry and special operations weapons, ammunition, missiles, clothing and individual equipment, power generation and decontamination equipment, and direct and indirect fire weapons. It operates over 670,000 acres of range, and almost all forms of individual sub-arctic environments (to include rugged mountains, tundra, glacial stream beds, deep forest, and snow and ice fields) are available within 50 miles of Fort Greely. CRTC is the only U.S. test site that realistically combines the elements of a winter battlefield with a test season long and cold enough to guarantee suitable test conditions. The winter test window runs from October to March, with the coldest temperatures usually experienced in December and January. Temperate testing, approximating the Northern European climate, is available from April through September. CRTC retains priority of use on airspace overlying its test ranges.

c. *Tropic Region Test Center (TRTC)*. TRTC is headquartered at YPG, with its primary tropic test facilities located in Hawaii at Schofield Barracks. With the 1999 closure of Army tropic testing facilities in the Republic of Panama, tropic test facilities are currently being reestablished over a wide geographic area. Testing will be performed on-site, with people and equipment safaried from YPG or other sites as needed. TRTC conducts humid tropic tests on a wide variety of military systems, materials, weapons, and equipment of all conceivable types, sizes, configurations, and uses, to determine the effects of tropic conditions on materiel, soldier performance, and reliability. The combined factors of heat, humidity, solar radiation, insects, fungus, bacteria, and rainfall can quickly reduce the performance of both soldier and machine and corrode materials beyond utility. The Army Research Office (ARO) study performed to validate tropic test sites indicates that Hawaii meets many of the tropic conditions required; however, certain tests, notably those dealing with sensors and communications systems, require extreme conditions such as those found in the Republic of Panama. For this reason, YPG has worked through the State Department and negotiated Cooperative Research and Development Agreements with Panamanian universities for testing and research on sensors, communications equipment, and medical operations.